The Influence of Geomorphology on the Sensorial Quality of Red Wines from the Șarba wine region, Odobești Vineyard

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ABSTRACT. This study aims at making a sensorial analysis of red wines from the Șarba wine region, Odobești Vineyard. In order to determine wines from a sensory point of view, we first studied the influence of geomorphology on the sensory character. In the analysis of red wines sensorial quality we used several wines from 2012 (i.e. Pinot noir, Cabernet Sauvignon, Black Fetească and Merlot), as 2012 was a beneficial year from the point of view of red grapes ripening, and the oenoclimatic index was favourable to obtaining savoury and flavoured wines.
The vegetal flavour does not affect the wines' harmony too much.

1. INTRODUCTION

The Șarba wine region in the Odobești Vineyard is situated on the foothills of the Curvature Sub Carpathian region, that reach altitudes of 220 m. Due to the conditions of pedoclimate and soil, which is highly acidic, the wines obtained are appreciated as fresh and fruity. The lithological substratum is made of sands and alluvial-proluvial gravels, covered by loess deposits.
The alternance of these strata form a detritus Pleistocene complex, comprising marine pliocenic marls, clays and sands (Chiriac, 2009).
The soil is represented by leached chernozems (cambic and clay-illuviated), dominant in the Eastern and Central part of the wine region, and brown soils to the West. Through their medium and light texture, these soils ensure permeability (Chiriac, 2009).
The area's geomorphologic and hydrographic ensemble allows for the existence of a great variety of grapevine varieties in the plantation (Gâştescu, 2010). Global solar radiation reaches annual averages over 125 Kcal/cm², varying between 110 Northern exposures and 140 on Southern exposures (Figure 1).
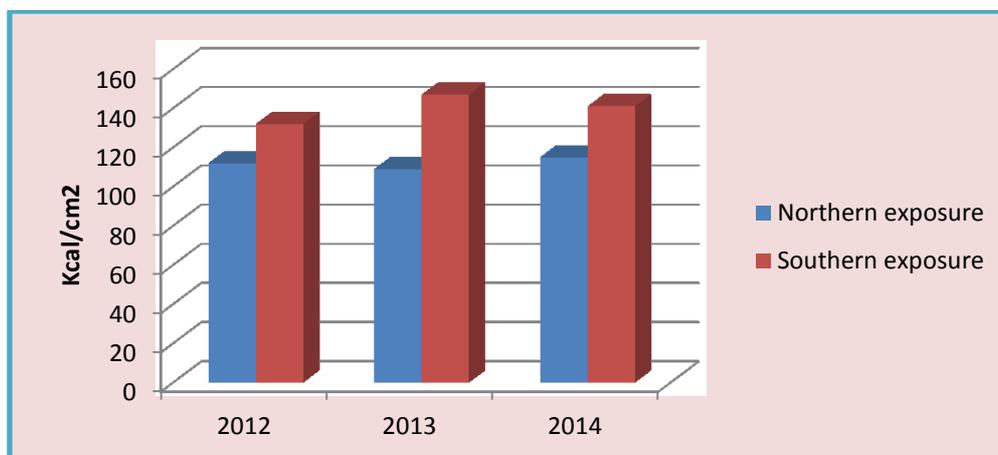

Figure 1. Global solar radiation measured during a 3-year period in the Șarba wine region on Northern and Southern exposures

The *average annual temperature* is the sum of thermic values measured in a 1-year interval and divided by the number of days.

Average annual temperature is about 9-10ºC, thus a medium thermal amplitude; the most important values were calculated in 2012 (www.meteorologia.ro).
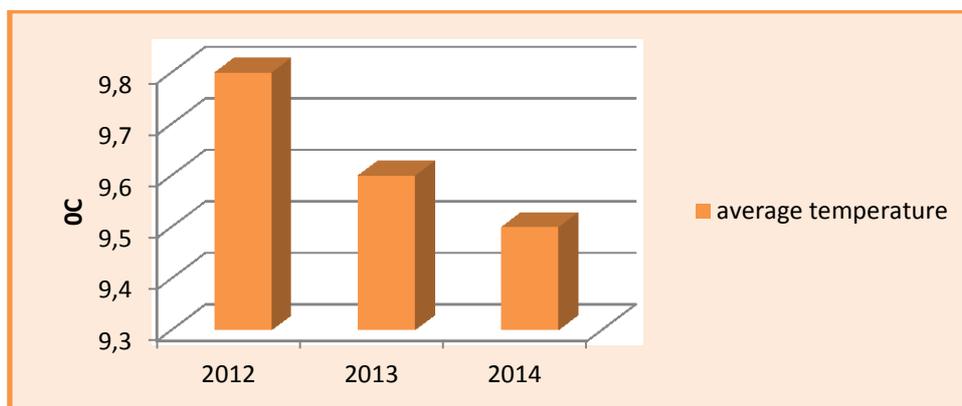

Figure 2. Average annual temperature measured in a 3-year interval in the Șarba wine region
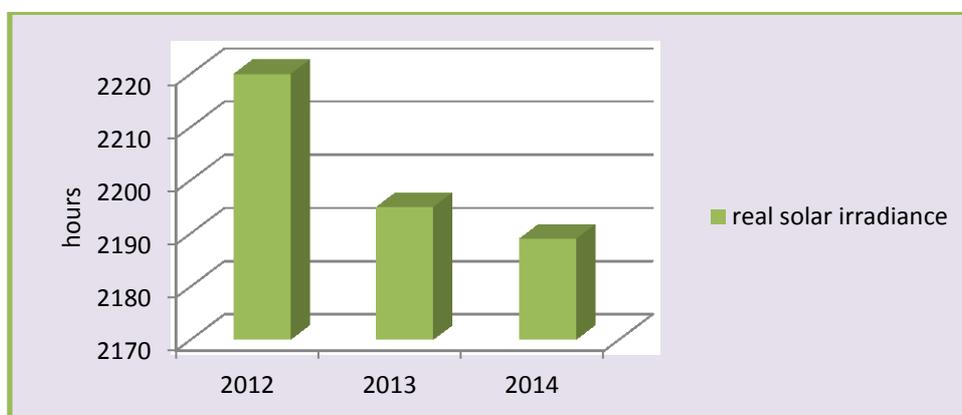

Figure 3. Solar irradiance measured in a 3-year interval in the Șarba wine region

The average annual duration of solar irradiance is about 2100 hours (Fig. 4). These high values also justify the annual amount of temperature that are lower than or equal to 0º C, around 3800º, which ensures for optimal ripening conditions and the concentration of sugars ad aromatic substances in grapes (Figure 3).

The oenoclimatic aptitude index is the sum of the active heat balance and the total real hours of sunshine, from which we subtract the excess precipitations during the active life of vines. The resulting values are higher than 4150, reaching 4214 in 2012, a value that is specific to the area (Figure 4).
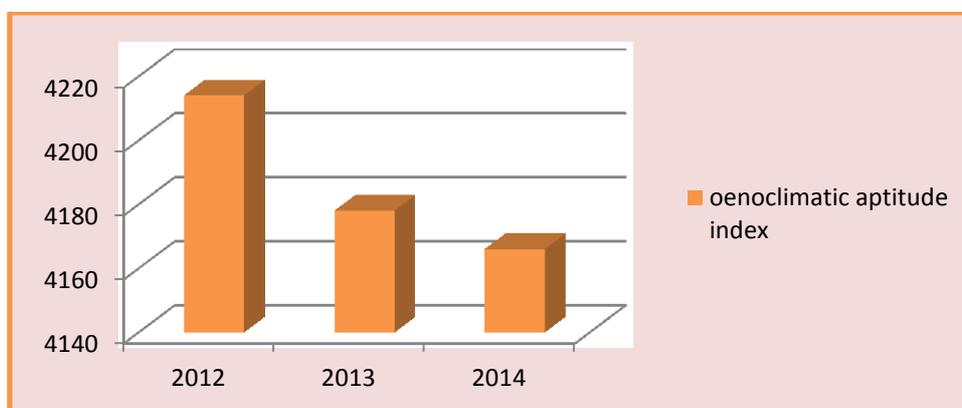

Figure 4. The oenoclimatic aptitude index of the Șarba wine region calculated for a 3-year interval
Based on these, grapevine finds an enabling environment, red varieties having smooth and aromatic sensory characters.

The quality of red wines depends on several factors, besides pedoclimate, i.e.: maceration enzymes used to extract flavour precursors (Lengyel et al. 2013, Cano-Lopez et al. 2010, Bautista – Ortin et al. 2005, Lengyel 2014), the micro-oxygenation of the fermentation process (Llaudy et al. 2006, Cano-Lopez et al. 2009), the stage of grape ripeness (De Montmollin et al. 2007, Dupraz et al. 2008). The concentration of phenolic compounds and anthocyanins leads to determining the primary flavour character of red wines (Lengyel 2012, Lengyel et al. 2012), but also to the amplification of wines' fruity notes.

Materials and methods

Red wines (Pinot noir, Cabernet Sauvignon, Fetească neagră and Merlot), production of 2012, from Șarba, Odobești, selected based on the most favourable oenoclimatic parameters.

The wines were tested by a sample of 10 oenology specialists; they marked each sensory characteristic from 1 to 10. The average marks given are visible in Figures 5, 6, 7, 8.

2. MATERIALS AND METHODS

The materials used in the present study consisted of four red wines from 2012 which, compared to the other two years, was beneficial to red grape ripening and to obtaining harmonious wines.

3. RESULTS AND DISCUSSIONS

Figures 5-8 show that Pinot noir wines show a high olfactory intensity, being marked between 4.5 in the case of Cabernet Sauvignon and 7.5 in the case of Pinot noir. The wines Black Fetească and Merlot recorded intermediary values; the average marks were 6.5 and 5.5 respectively.

It is noted that the wines Merlot and Cabernet Sauvignon is the least bitter, while the most bitter wines are Black Fetească, with wines being marked between 1.2 and 3.2. Pinot noir recorded average values, being marked 1.5.

The vegetal character of wines was marked between 5.3 in the case of Black Fetească and 3.3 in the case of Cabernet Sauvignon. The wines Pinot noir and Merlot got intermediary values, with an average of 4.3. In the case of Cabernet Sauvignon, the vegetal character is not as strong.

It is noted that the **bouquet** is less pronounced in the case of Cabernet Sauvignon and Merlot. From the point of view of the bouquet, the wines were marked between 6.2 (Black Fetească) and 8.2 (Merlot and Cabernet Sauvignon). Pinot noir wines recorded intermediary values; their average mark was 7.2.

The taste of berries is stronger in the case of Merlot wines, being marked between 4.1 (Cabernet Sauvignon) and 8.1 (Merlot). The wines Black Fetească and Merlot recorded intermediary values; the average marks were 6.1 and 7.1 respectively.

It is noted that the **taste of bananas** is stronger in the case of Pinot noir and Fetească neagră wines, as they are marked between 2.7 (Cabernet Sauvignon) and 5.7 (Pinot noir and Black Fetească). Merlot wines recorded intermediary values; their average mark was 4.7.

The taste of fruit is stronger in the case of Black Fetească and Merlot wines, being marked between 7.9 (Pinot noir and Cabernet Sauvignon) and 8.9 (Fetească neagră and Merlot). Black Fetească wines are very **buttery**, being marked between 7.9 (Merlot) and 9 (Fetească neagră).

Cabernet sauvignon and Pinot noir wines recorded intermediary values; the average marks were 8.1 and 8.4 respectively.

Cabernet Sauvignon wines are the most **savoury**; wines were marked between 5.8 (Fetească neagră) and 7.8 (Cabernet sauvignon). Pinot noir and Merlot wines recorded intermediary values; the average mark was 6.8.

It is noted that Cabernet Sauvignon wines are the most **harmonious**; wines were marked between 5.9 (Pinot noir and Black Fetească) and 7.9 (Cabernet sauvignon and Merlot).

It is noted that the **taste of caramel** is more pronounced in the case of Fetească neagră wines; wines were marked between 1.4 (Pinot noir) and 4.4 (Black Fetească). Cabernet sauvignon and Merlot recorded intermediary values; the average marks were 2.4 and 3.4 respectively.

It is noted that Black Fetească wines are highly full bodied; wines were marked between 6.1 (Merlot) and 8.1 (Black Fetească). Pinot noir and Cabernet sauvignon recorded intermediary values; the average marks were 6.2 and 7.1 respectively.

It is noted that Merlot wines have a less **leathery** taste; wines were marked between 1.3 (Merlot) and 3.4 (Black Fetească). Cabernet sauvignon and Pinot noir wines recorded intermediary values; the average marks were 1.4 and 2.4 respectively.
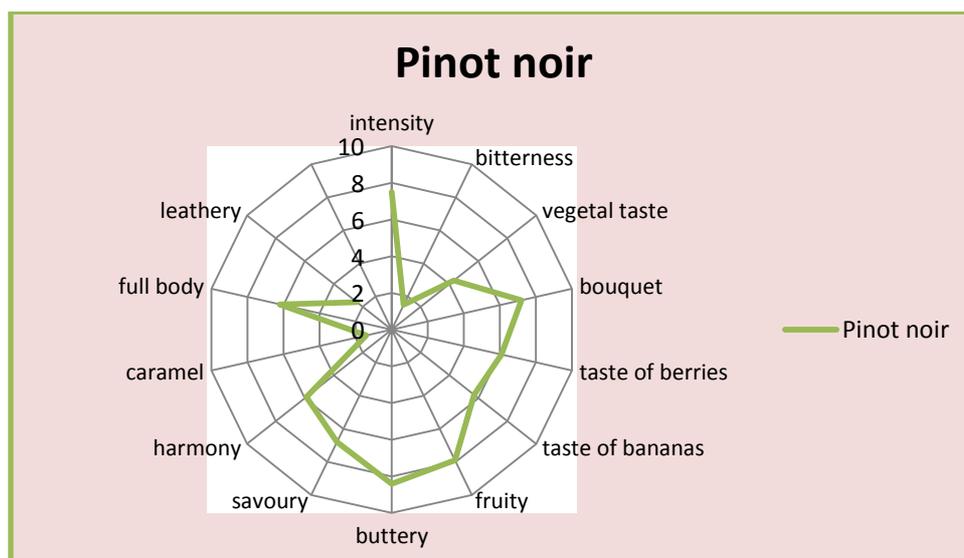

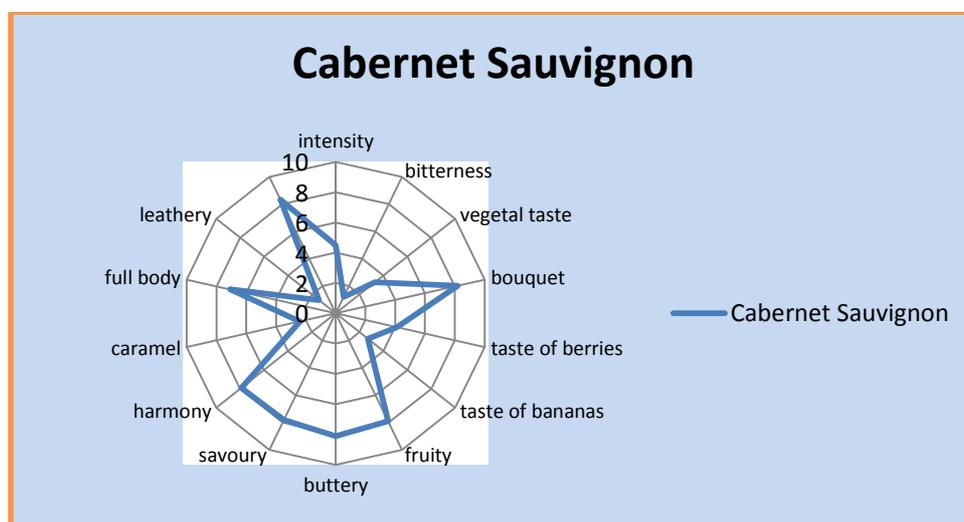Figure 5. Sensory analysis of the Pinot Noir wine from Şarba, Odobeşti

Figure 6. Sensory analysis of the Cabernet Sauvignon wine from Şarba, Odobeşti
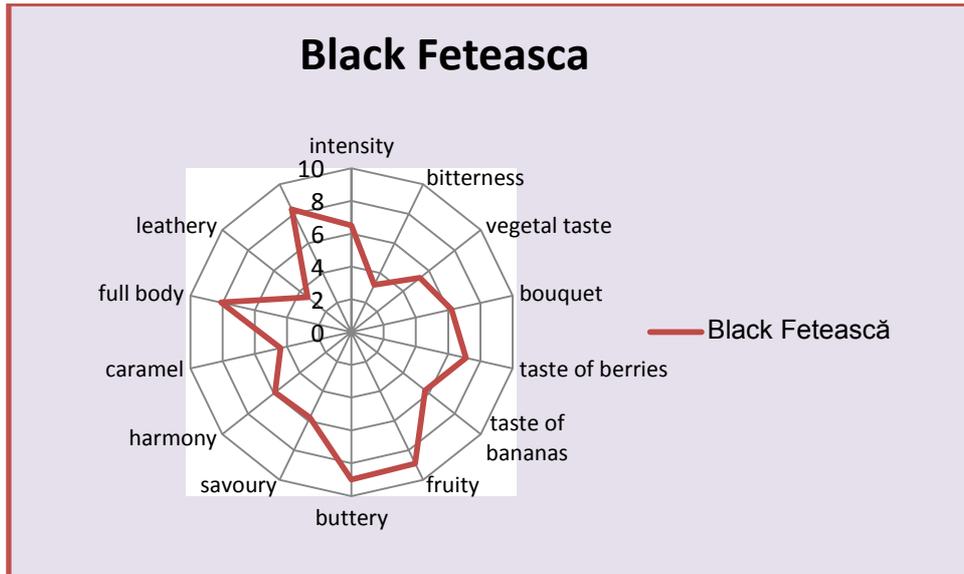
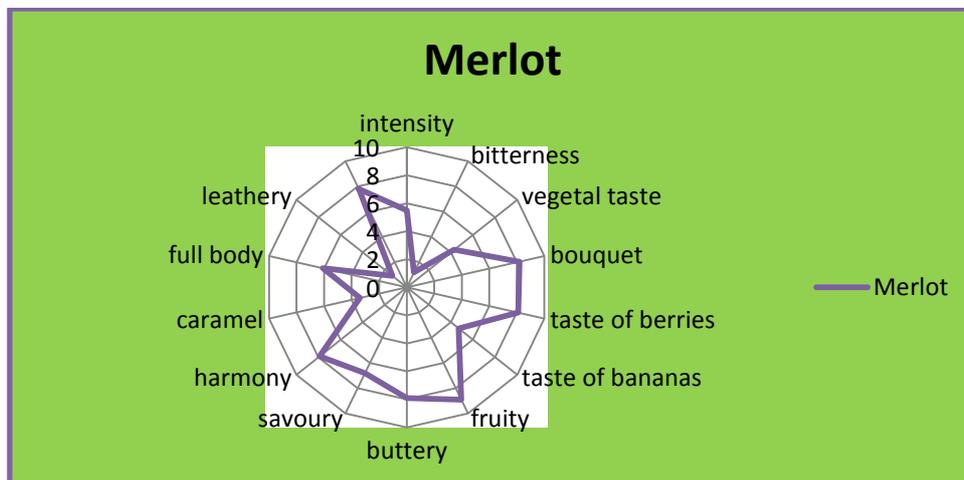Figure 7. Sensory analysis of the Black Fetească wine from Șarba, Odobești

Figure 8. Sensory analysis of the Merlot wine from Șarba, Odobești

4. CONCLUSIONS

Red wines of 2012 show intense olfactory notes, a full body and a bouquet specific to the variety.

The most beneficial year for red grape ripening was 2012, as the oenoclimatic index was most beneficial to these varieties in order to obtain buttery wines, having berry, savoury and fruity flavors.

Pedoclimatic indicators in the area resulted in harmonious wines, with notes of caramel and faint leathery notes.

A faint vegetal flavour consistent with the geomorphological and hydrographic ensemble of the area is always present, but it does not affect the harmonious character of wines.

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